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<120> DETECTION AND TREATMENT OF POLYCYSTIC KIDNEY DISEASE

<130> JHU1680-2

<140> US 09/904,968
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tcatagccag gtgtgggctc ggctggagtc tgtgcagggg ctttgctatg ggacggaggg 53100

tgcaccagag gtaggctggg gttggagtag gcggcttcct cgcagatctg aaggcagagg 53160

cggcttgggc agtaagtctg ggaggcgtgg caaccgctct gcccacacac ccgccccaca 53220

gcttgggcag ccagcacacc ccgctgaggg agccccatat tccctacccg ctggcggagc 53280

gcttgatgtg gcggagcggg caatccactt ggaggggtag atatcggtgg ggttggagcg 53340

gctatgatgc acctgtgagg ccatctgggg acgtaggcag ggggtgagct cactatcagg 53400

tggcacctgg gcctgtccca ccagctcacg cctggaccca cccccactca catttgcgtg 53460

cagggccatc tggcgggcca cgaagggcag gttgcggtca gacacgatct tggccacgct 53520

gg 53522

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<212> PRT
<213> Homo sapiens

<400> 2

Met Pro Pro Ala Ala Pro Ala Arg Leu Ala Leu Ala Leu Gly Leu Gly
1 5 10 15

Leu Trp Leu Gly Ala Leu Ala Gly Gly Pro Gly Arg Gly Cys Gly Pro
20 25 30

Cys Glu Pro Pro Cys Leu Cys Gly Pro Ala Pro Gly Ala Ala Cys Arg

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        35                  40                  45

Val Asn Cys Ser Gly Arg Gly Leu Arg Thr Leu Gly Pro Ala Leu Arg
    50                  55                  60

Ile Pro Ala Asp Ala Thr Glu Leu Asp Val Ser His Asn Leu Leu Arg
65                  70                  75                  80

Ala Leu Asp Val Gly Leu Leu Ala Asn Leu Ser Ala Leu Ala Glu Leu
                85                  90                  95

Asp Ile Ser Asn Asn Lys Ile Ser Thr Leu Glu Glu Gly Ile Phe Ala
            100                 105                 110

Asn Leu Phe Asn Leu Ser Glu Ile Asn Leu Ser Gly Asn Pro Phe Glu
        115                 120                 125

Cys Asp Cys Gly Leu Ala Trp Leu Pro Gln Trp Ala Glu Glu Gln Gln
    130                 135                 140

Val Arg Val Val Gln Pro Glu Ala Ala Thr Cys Ala Gly Pro Gly Ser
145                 150                 155                 160

Leu Ala Gly Gln Pro Leu Leu Gly Ile Pro Leu Leu Asp Ser Gly Cys
                165                 170                 175

Gly Glu Glu Tyr Val Ala Cys Leu Pro Asp Asn Ser Ser Gly Thr Val
            180                 185                 190

Ala Ala Val Ser Phe Ser Ala Ala His Glu Gly Leu Leu Gln Pro Glu
        195                 200                 205

Ala Cys Ser Ala Phe Cys Phe Ser Thr Gly Gln Gly Leu Ala Ala Leu
    210                 215                 220

Ser Glu Gln Gly Trp Cys Leu Cys Gly Ala Ala Gln Pro Ser Ser Ala
225                 230                 235                 240

Ser Phe Ala Cys Leu Ser Leu Cys Ser Gly Pro Pro Ala Pro Pro Ala
                245                 250                 255

Pro Thr Cys Arg Gly Pro Thr Leu Leu Gln His Val Phe Pro Ala Ser
            260                 265                 270

Pro Gly Ala Thr Leu Val Gly Pro His Gly Pro Leu Ala Ser Gly Gln
        275                 280                 285

Leu Ala Ala Phe His Ile Ala Ala Pro Leu Pro Val Thr Asp Thr Arg
    290                 295                 300

Trp Asp Phe Gly Asp Gly Ser Ala Glu Val Asp Ala Ala Gly Pro Ala
305                 310                 315                 320

Ala Ser His Arg Tyr Val Leu Pro Gly Arg Tyr His Val Thr Ala Val
                325                 330                 335

Leu Ala Leu Gly Ala Gly Ser Ala Leu Leu Gly Thr Asp Val Gln Val
            340                 345                 350

Glu Ala Ala Pro Ala Ala Leu Glu Leu Val Cys Pro Ser Ser Val Gln
        355                 360                 365
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Ser Asp Glu Ser Leu Asp Leu Ser Ile Gln Asn Arg Gly Gly Ser Gly
    370                 375                 380

Leu Glu Ala Ala Tyr Ser Ile Val Ala Leu Gly Glu Glu Pro Ala Arg
385                 390                 395                 400

Ala Val His Pro Leu Cys Pro Ser Asp Thr Glu Ile Phe Pro Gly Asn
                405                 410                 415

Gly His Cys Tyr Arg Leu Val Val Glu Lys Ala Ala Trp Leu Gln Ala
            420                 425                 430

Gln Glu Gln Cys Gln Ala Trp Ala Gly Ala Ala Leu Ala Met Val Asp
        435                 440                 445

Ser Pro Ala Val Gln Arg Phe Leu Val Ser Arg Val Thr Arg Ser Leu
    450                 455                 460

Asp Val Trp Ile Gly Phe Ser Thr Val Gln Gly Val Glu Val Gly Pro
465                 470                 475                 480

Ala Pro Gln Gly Glu Ala Phe Ser Leu Glu Ser Cys Gln Asn Trp Leu
                485                 490                 495

Pro Gly Glu Pro His Pro Ala Thr Ala Glu His Cys Val Arg Leu Gly
            500                 505                 510

Pro Thr Gly Trp Cys Asn Thr Asp Leu Cys Ser Ala Pro His Ser Tyr
        515                 520                 525

Val Cys Glu Leu Gln Pro Gly Gly Pro Val Gln Asp Ala Glu Asn Leu
    530                 535                 540

Leu Val Gly Ala Pro Ser Gly Asp Leu Gln Gly Pro Leu Thr Pro Leu
545                 550                 555                 560

Ala Gln Gln Asp Gly Leu Ser Ala Pro His Glu Pro Val Glu Val Met
                565                 570                 575

Val Phe Pro Gly Leu Arg Leu Ser Arg Glu Ala Phe Leu Thr Thr Ala
            580                 585                 590

Glu Phe Gly Thr Gln Glu Leu Arg Arg Pro Ala Gln Leu Arg Leu Gln
        595                 600                 605

Val Tyr Arg Leu Leu Ser Thr Ala Gly Thr Pro Glu Asn Gly Ser Glu
    610                 615                 620

Pro Glu Ser Arg Ser Pro Asp Asn Arg Thr Gln Leu Ala Pro Ala Cys
625                 630                 635                 640

Met Pro Gly Gly Arg Trp Cys Pro Gly Ala Asn Ile Cys Leu Pro Leu
                645                 650                 655

Asp Ala Ser Cys His Pro Gln Ala Cys Ala Asn Gly Cys Thr Ser Gly
            660                 665                 670

Pro Gly Leu Pro Gly Ala Pro Tyr Ala Leu Trp Arg Glu Phe Leu Phe
        675                 680                 685
```

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Ser Val Pro Ala Gly Pro Pro Ala Gln Tyr Ser Val Thr Leu His Gly
    690                 695                 700

Gln Asp Val Leu Met Leu Pro Gly Asp Leu Val Gly Leu Gln His Asp
705                 710                 715                 720

Ala Gly Pro Gly Ala Leu Leu His Cys Ser Pro Ala Pro Gly His Pro
                725                 730                 735

Gly Pro Arg Ala Pro Tyr Leu Ser Ala Asn Ala Ser Ser Trp Leu Pro
            740                 745                 750

His Leu Pro Ala Gln Leu Glu Gly Thr Trp Gly Cys Pro Ala Cys Ala
        755                 760                 765

Leu Arg Leu Leu Ala Gln Arg Glu Gln Leu Thr Val Leu Leu Gly Leu
    770                 775                 780

Arg Pro Asn Pro Gly Leu Arg Leu Pro Gly Arg Tyr Glu Val Arg Ala
785                 790                 795                 800

Glu Val Gly Asn Gly Val Ser Arg His Asn Leu Ser Cys Ser Phe Asp
                805                 810                 815

Val Val Ser Pro Val Ala Gly Leu Arg Val Ile Tyr Pro Ala Pro Arg
            820                 825                 830

Asp Gly Arg Leu Tyr Val Pro Thr Asn Gly Ser Ala Leu Val Leu Gln
        835                 840                 845

Val Asp Ser Gly Ala Asn Ala Thr Ala Thr Ala Arg Trp Pro Gly Gly
    850                 855                 860

Ser Leu Ser Ala Arg Phe Glu Asn Val Cys Pro Ala Leu Val Ala Thr
865                 870                 875                 880

Phe Val Pro Ala Cys Pro Trp Glu Thr Asn Asp Thr Leu Phe Ser Val
                885                 890                 895

Val Ala Leu Pro Trp Leu Ser Glu Gly Glu His Val Val Asp Val Val
            900                 905                 910

Val Glu Asn Ser Ala Ser Arg Ala Asn Leu Ser Leu Arg Val Thr Ala
        915                 920                 925

Glu Glu Pro Ile Cys Gly Leu Arg Ala Thr Pro Ser Pro Glu Ala Arg
    930                 935                 940

Val Leu Gln Gly Val Leu Val Arg Tyr Ser Pro Val Val Glu Ala Gly
945                 950                 955                 960

Ser Asp Met Val Phe Arg Trp Thr Ile Asn Asp Lys Gln Ser Leu Thr
                965                 970                 975

Phe Gln Asn Val Val Phe Asn Val Ile Tyr Gln Ser Ala Ala Val Phe
            980                 985                 990

Lys Leu Ser Leu Thr Ala Ser Asn  His Val Ser Asn Val  Thr Val Asn
        995                 1000                1005

Tyr Asn  Val Thr Val Glu Arg  Met Asn Arg Met Gln  Gly Leu Gln
```

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    1010                1015                1020

Val Ser  Thr Val Pro Ala Val  Leu Ser Pro Asn Ala  Thr Leu Ala
    1025                1030                1035

Leu Thr  Ala Gly Val Leu Val  Asp Ser Ala Val Glu  Val Ala Phe
    1040                1045                1050

Leu Trp  Thr Phe Gly Asp Gly  Glu Gln Ala Leu His  Gln Phe Gln
    1055                1060                1065

Pro Pro  Tyr Asn Glu Ser Phe  Pro Val Pro Asp Pro  Ser Val Ala
    1070                1075                1080

Gln Val  Leu Val Glu His Asn  Val Thr His Thr Tyr  Ala Ala Pro
    1085                1090                1095

Gly Glu  Tyr Leu Leu Thr Val  Leu Ala Ser Asn Ala  Phe Glu Asn
    1100                1105                1110

Leu Thr  Gln Gln Val Pro Val  Ser Val Arg Ala Ser  Leu Pro Ser
    1115                1120                1125

Val Ala  Val Gly Val Ser Asp  Gly Val Leu Val Ala  Gly Arg Pro
    1130                1135                1140

Val Thr  Phe Tyr Pro His Pro  Leu Pro Ser Pro Gly  Gly Val Leu
    1145                1150                1155

Tyr Thr  Trp Asp Phe Gly Asp  Gly Ser Pro Val Leu  Thr Gln Ser
    1160                1165                1170

Gln Pro  Ala Ala Asn His Thr  Tyr Ala Ser Arg Gly  Thr Tyr His
    1175                1180                1185

Val Arg  Leu Glu Val Asn Asn  Thr Val Ser Gly Ala  Ala Ala Gln
    1190                1195                1200

Ala Asp  Val Arg Val Phe Glu  Glu Leu Arg Gly Leu  Ser Val Asp
    1205                1210                1215

Met Ser  Leu Ala Val Glu Gln  Gly Ala Pro Val Val  Val Ser Ala
    1220                1225                1230

Ala Val  Gln Thr Gly Asp Asn  Ile Thr Trp Thr Phe  Asp Met Gly
    1235                1240                1245

Asp Gly  Thr Val Leu Ser Gly  Pro Glu Ala Thr Val  Glu His Val
    1250                1255                1260

Tyr Leu  Arg Ala Gln Asn Cys  Thr Val Thr Val Gly  Ala Gly Ser
    1265                1270                1275

Pro Ala  Gly His Leu Ala Arg  Ser Leu His Val Leu  Val Phe Val
    1280                1285                1290

Leu Glu  Val Leu Arg Val Glu  Pro Ala Ala Cys Ile  Pro Thr Gln
    1295                1300                1305

Pro Asp  Ala Arg Leu Thr Ala  Tyr Val Thr Gly Asn  Pro Ala His
    1310                1315                1320
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Tyr Leu  Phe Asp Trp Thr Phe  Gly Asp Gly Ser Ser  Asn Thr Thr
    1325                 1330                 1335

Val Arg  Gly Cys Pro Thr Val  Thr His Asn Phe Thr  Arg Ser Gly
    1340                 1345                 1350

Thr Phe  Pro Leu Ala Leu Val  Leu Ser Ser Arg Val  Asn Arg Ala
    1355                 1360                 1365

His Tyr  Phe Thr Ser Ile Cys  Val Glu Pro Glu Val  Gly Asn Val
    1370                 1375                 1380

Thr Leu  Gln Pro Glu Arg Gln  Phe Val Gln Leu Gly  Asp Glu Ala
    1385                 1390                 1395

Trp Leu  Val Ala Cys Ala Trp  Pro Pro Phe Pro Tyr  Arg Tyr Thr
    1400                 1405                 1410

Trp Asp  Phe Gly Thr Glu Glu  Ala Ala Pro Thr Arg  Ala Arg Gly
    1415                 1420                 1425

Pro Glu  Val Thr Phe Ile Tyr  Arg Asp Pro Gly Ser  Tyr Leu Val
    1430                 1435                 1440

Thr Val  Thr Ala Ser Asn Asn  Ile Ser Ala Ala Asn  Asp Ser Ala
    1445                 1450                 1455

Leu Val  Glu Val Gln Glu Pro  Val Leu Val Thr Ser  Ile Lys Val
    1460                 1465                 1470

Asn Gly  Ser Leu Gly Leu Glu  Leu Gln Gln Pro Tyr  Leu Phe Ser
    1475                 1480                 1485

Ala Val  Gly Arg Gly Arg Pro  Ala Ser Tyr Leu Trp  Asp Leu Gly
    1490                 1495                 1500

Asp Gly  Gly Trp Leu Glu Gly  Pro Glu Val Thr His  Ala Tyr Asn
    1505                 1510                 1515

Ser Thr  Gly Asp Phe Thr Val  Arg Val Ala Gly Trp  Asn Glu Val
    1520                 1525                 1530

Ser Arg  Ser Glu Ala Trp Leu  Asn Val Thr Val Lys  Arg Arg Val
    1535                 1540                 1545

Arg Gly  Leu Val Val Asn Ala  Ser Arg Thr Val Val  Pro Leu Asn
    1550                 1555                 1560

Gly Ser  Val Ser Phe Ser Thr  Ser Leu Glu Ala Gly  Ser Asp Val
    1565                 1570                 1575

Arg Tyr  Ser Trp Val Leu Cys  Asp Arg Cys Thr Pro  Ile Pro Gly
    1580                 1585                 1590

Gly Pro  Thr Ile Ser Tyr Thr  Phe Arg Ser Val Gly  Thr Phe Asn
    1595                 1600                 1605

Ile Ile  Val Thr Ala Glu Asn  Glu Val Gly Ser Ala  Gln Asp Ser
    1610                 1615                 1620
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Ile Phe  Val Tyr Val Leu Gln  Leu Ile Glu Gly Leu  Gln Val Val
    1625                 1630                 1635

Gly Gly  Gly Arg Tyr Phe Pro  Thr Asn His Thr Val  Gln Leu Gln
    1640                 1645                 1650

Ala Val  Val Arg Asp Gly Thr  Asn Val Ser Tyr Ser  Trp Thr Ala
    1655                 1660                 1665

Trp Arg  Asp Arg Gly Pro Ala  Leu Ala Gly Ser Gly  Lys Gly Phe
    1670                 1675                 1680

Ser Leu  Thr Val Leu Glu Ala  Gly Thr Tyr His Val  Gln Leu Arg
    1685                 1690                 1695

Ala Thr  Asn Met Leu Gly Ser  Ala Trp Ala Asp Cys  Thr Met Asp
    1700                 1705                 1710

Phe Val  Glu Pro Val Gly Trp  Leu Met Val Ala Ala  Ser Pro Asn
    1715                 1720                 1725

Pro Ala  Ala Val Asn Thr Ser  Val Thr Leu Ser Ala  Glu Leu Ala
    1730                 1735                 1740

Gly Gly  Ser Gly Val Val Tyr  Thr Trp Ser Leu Glu  Glu Gly Leu
    1745                 1750                 1755

Ser Trp  Glu Thr Ser Glu Pro  Phe Thr Thr His Ser  Phe Pro Thr
    1760                 1765                 1770

Pro Gly  Leu His Leu Val Thr  Met Thr Ala Gly Asn  Pro Leu Gly
    1775                 1780                 1785

Ser Ala  Asn Ala Thr Val Glu  Val Asp Val Gln Val  Pro Val Ser
    1790                 1795                 1800

Gly Leu  Ser Ile Arg Ala Ser  Glu Pro Gly Gly Ser  Phe Val Ala
    1805                 1810                 1815

Ala Gly  Ser Ser Val Pro Phe  Trp Gly Gln Leu Ala  Thr Gly Thr
    1820                 1825                 1830

Asn Val  Ser Trp Cys Trp Ala  Val Pro Gly Gly Ser  Ser Lys Arg
    1835                 1840                 1845

Gly Pro  His Val Thr Met Val  Phe Pro Asp Ala Gly  Thr Phe Ser
    1850                 1855                 1860

Ile Arg  Leu Asn Ala Ser Asn  Ala Val Ser Trp Val  Ser Ala Thr
    1865                 1870                 1875

Tyr Asn  Leu Thr Ala Glu Glu  Pro Ile Val Gly Leu  Val Leu Trp
    1880                 1885                 1890

Ala Ser  Ser Lys Val Val Ala  Pro Gly Gln Leu Val  His Phe Gln
    1895                 1900                 1905

Ile Leu  Leu Ala Ala Gly Ser  Ala Val Thr Phe Arg  Leu Gln Val
    1910                 1915                 1920

Gly Gly  Ala Asn Pro Glu Val  Leu Pro Gly Pro Arg  Phe Ser His
```

1925 1930 1935

Ser Phe Pro Arg Val Gly Asp His Val Val Ser Val Arg Gly Lys
1940 1945 1950

Asn His Val Ser Trp Ala Gln Ala Gln Val Arg Ile Val Val Leu
1955 1960 1965

Glu Ala Val Ser Gly Leu Gln Val Pro Asn Cys Cys Glu Pro Gly
1970 1975 1980

Ile Ala Thr Gly Thr Glu Arg Asn Phe Thr Ala Arg Val Gln Arg
1985 1990 1995

Gly Ser Arg Val Ala Tyr Ala Trp Tyr Phe Ser Leu Gln Lys Val
2000 2005 2010

Gln Gly Asp Ser Leu Val Ile Leu Ser Gly Arg Asp Val Thr Tyr
2015 2020 2025

Thr Pro Val Ala Ala Gly Leu Leu Glu Ile Gln Val Arg Ala Phe
2030 2035 2040

Asn Ala Leu Gly Ser Glu Asn Arg Thr Leu Val Leu Glu Val Gln
2045 2050 2055

Asp Ala Val Gln Tyr Val Ala Leu Gln Ser Gly Pro Cys Phe Thr
2060 2065 2070

Asn Arg Ser Ala Gln Phe Glu Ala Ala Thr Ser Pro Ser Pro Arg
2075 2080 2085

Arg Val Ala Tyr His Trp Asp Phe Gly Asp Gly Ser Pro Gly Gln
2090 2095 2100

Asp Thr Asp Glu Pro Arg Ala Glu His Ser Tyr Leu Arg Pro Gly
2105 2110 2115

Asp Tyr Arg Val Gln Val Asn Ala Ser Asn Leu Val Ser Phe Phe
2120 2125 2130

Val Ala Gln Ala Thr Val Thr Val Gln Val Leu Ala Cys Arg Glu
2135 2140 2145

Pro Glu Val Asp Val Val Leu Pro Leu Gln Val Leu Met Arg Arg
2150 2155 2160

Ser Gln Arg Asn Tyr Leu Glu Ala His Val Asp Leu Arg Asp Cys
2165 2170 2175

Val Thr Tyr Gln Thr Glu Tyr Arg Trp Glu Val Tyr Arg Thr Ala
2180 2185 2190

Ser Cys Gln Arg Pro Gly Arg Pro Ala Arg Val Ala Leu Pro Gly
2195 2200 2205

Val Asp Val Ser Arg Pro Arg Leu Val Leu Pro Arg Leu Ala Leu
2210 2215 2220

Pro Val Gly His Tyr Cys Phe Val Phe Val Val Ser Phe Gly Asp
2225 2230 2235

```
Thr Pro  Leu Thr Gln Ser Ile  Gln Ala Asn Val Thr  Val Ala Pro
    2240                 2245                 2250

Glu Arg  Leu Val Pro Ile Ile  Glu Gly Gly Ser Tyr  Arg Val Trp
    2255                 2260                 2265

Ser Asp  Thr Arg Asp Leu Val  Leu Asp Gly Ser Glu  Ser Tyr Asp
    2270                 2275                 2280

Pro Asn  Leu Glu Asp Gly Asp  Gln Thr Pro Leu Ser  Phe His Trp
    2285                 2290                 2295

Ala Cys  Val Ala Ser Thr Gln  Arg Glu Ala Gly Gly  Cys Ala Leu
    2300                 2305                 2310

Asn Phe  Gly Pro Arg Gly Ser  Ser Thr Val Thr Ile  Pro Arg Glu
    2315                 2320                 2325

Arg Leu  Ala Ala Gly Val Glu  Tyr Thr Phe Ser Leu  Thr Val Trp
    2330                 2335                 2340

Lys Ala  Gly Arg Lys Glu Glu  Ala Thr Asn Gln Thr  Val Leu Ile
    2345                 2350                 2355

Arg Ser  Gly Arg Val Pro Ile  Val Ser Leu Glu Cys  Val Ser Cys
    2360                 2365                 2370

Lys Ala  Gln Ala Val Tyr Glu  Val Ser Arg Ser Ser  Tyr Val Tyr
    2375                 2380                 2385

Leu Glu  Gly Arg Cys Leu Asn  Cys Ser Ser Gly Ser  Lys Arg Gly
    2390                 2395                 2400

Arg Trp  Ala Ala Arg Thr Phe  Ser Asn Lys Thr Leu  Val Leu Asp
    2405                 2410                 2415

Glu Thr  Thr Thr Ser Thr Gly  Ser Ala Gly Met Arg  Leu Val Leu
    2420                 2425                 2430

Arg Arg  Gly Val Leu Arg Asp  Gly Glu Gly Tyr Thr  Phe Thr Leu
    2435                 2440                 2445

Thr Val  Leu Gly Arg Ser Gly  Glu Glu Glu Gly Cys  Ala Ser Ile
    2450                 2455                 2460

Arg Leu  Ser Pro Asn Arg Pro  Pro Leu Gly Gly Ser  Cys Arg Leu
    2465                 2470                 2475

Phe Pro  Leu Gly Ala Val His  Ala Leu Thr Thr Lys  Val His Phe
    2480                 2485                 2490

Glu Cys  Thr Gly Trp His Asp  Ala Glu Asp Ala Gly  Ala Pro Leu
    2495                 2500                 2505

Val Tyr  Ala Leu Leu Leu Arg  Arg Cys Arg Gln Gly  His Cys Glu
    2510                 2515                 2520

Glu Phe  Cys Val Tyr Lys Gly  Ser Leu Ser Ser Tyr  Gly Ala Val
    2525                 2530                 2535
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Leu Pro  Pro Gly Phe Arg Pro  His Phe Glu Val Gly  Leu Ala Val
    2540                 2545                 2550

Val Val  Gln Asp Gln Leu Gly  Ala Ala Val Val Ala  Leu Asn Arg
    2555                 2560                 2565

Ser Leu  Ala Ile Thr Leu Pro  Glu Pro Asn Gly Ser  Ala Thr Gly
    2570                 2575                 2580

Leu Thr  Val Trp Leu His Gly  Leu Thr Ala Ser Val  Leu Pro Gly
    2585                 2590                 2595

Leu Leu  Arg Gln Ala Asp Pro  Gln His Val Ile Glu  Tyr Ser Leu
    2600                 2605                 2610

Ala Leu  Val Thr Val Leu Asn  Glu Tyr Glu Arg Ala  Leu Asp Val
    2615                 2620                 2625

Ala Ala  Glu Pro Lys His Glu  Arg Gln His Arg Ala  Gln Ile Arg
    2630                 2635                 2640

Lys Asn  Ile Thr Glu Thr Leu  Val Ser Leu Arg Val  His Thr Val
    2645                 2650                 2655

Asp Asp  Ile Gln Gln Ile Ala  Ala Ala Leu Ala Gln  Cys Met Gly
    2660                 2665                 2670

Pro Ser  Arg Glu Leu Val Cys  Arg Ser Cys Leu Lys  Gln Thr Leu
    2675                 2680                 2685

His Lys  Leu Glu Ala Met Met  Leu Ile Leu Gln Ala  Glu Thr Thr
    2690                 2695                 2700

Ala Gly  Thr Val Thr Pro Thr  Ala Ile Gly Asp Ser  Ile Leu Asn
    2705                 2710                 2715

Ile Thr  Gly Asp Leu Ile His  Leu Ala Ser Ser Asp  Val Arg Ala
    2720                 2725                 2730

Pro Gln  Pro Ser Glu Leu Gly  Ala Glu Ser Pro Ser  Arg Met Val
    2735                 2740                 2745

Ala Ser  Gln Ala Tyr Asn Leu  Thr Ser Ala Leu Met  Arg Ile Leu
    2750                 2755                 2760

Met Arg  Ser Arg Val Leu Asn  Glu Glu Pro Leu Thr  Leu Ala Gly
    2765                 2770                 2775

Glu Glu  Ile Val Ala Gln Gly  Lys Arg Ser Asp Pro  Arg Ser Leu
    2780                 2785                 2790

Leu Cys  Tyr Gly Gly Ala Pro  Gly Pro Gly Cys His  Phe Ser Ile
    2795                 2800                 2805

Pro Glu  Ala Phe Ser Gly Ala  Leu Ala Asn Leu Ser  Asp Val Val
    2810                 2815                 2820

Gln Leu  Ile Phe Leu Val Asp  Ser Asn Pro Phe Pro  Phe Gly Tyr
    2825                 2830                 2835

Ile Ser  Asn Tyr Thr Val Ser  Thr Lys Val Ala Ser  Met Ala Phe
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    2840                2845                2850

Gln Thr  Gln Ala Gly Ala Gln  Ile Pro Ile Glu Arg  Leu Ala Ser
    2855                2860                2865

Glu Arg  Ala Ile Thr Val Lys  Val Pro Asn Asn Ser  Asp Trp Ala
    2870                2875                2880

Ala Arg  Gly His Arg Ser Ser  Ala Asn Ser Ala Asn  Ser Val Val
    2885                2890                2895

Val Gln  Pro Gln Ala Ser Val  Gly Ala Val Val Thr  Leu Asp Ser
    2900                2905                2910

Ser Asn  Pro Ala Ala Gly Leu  His Leu Gln Leu Asn  Tyr Thr Leu
    2915                2920                2925

Leu Asp  Gly His Tyr Leu Ser  Glu Glu Pro Glu Pro  Tyr Leu Ala
    2930                2935                2940

Val Tyr  Leu His Ser Glu Pro  Arg Pro Asn Glu His  Asn Cys Ser
    2945                2950                2955

Ala Ser  Arg Arg Ile Arg Pro  Glu Ser Leu Gln Gly  Ala Asp His
    2960                2965                2970

Arg Pro  Tyr Thr Phe Phe Ile  Ser Pro Gly Ser Arg  Asp Pro Ala
    2975                2980                2985

Gly Ser  Tyr His Leu Asn Leu  Ser Ser His Phe Arg  Trp Ser Ala
    2990                2995                3000

Leu Gln  Val Ser Val Gly Leu  Tyr Thr Ser Leu Cys  Gln Tyr Phe
    3005                3010                3015

Ser Glu  Glu Asp Met Val Trp  Arg Thr Glu Gly Leu  Leu Pro Leu
    3020                3025                3030

Glu Glu  Thr Ser Pro Arg Gln  Ala Val Cys Leu Thr  Arg His Leu
    3035                3040                3045

Thr Ala  Phe Gly Ala Ser Leu  Phe Val Pro Pro Ser  His Val Arg
    3050                3055                3060

Phe Val  Phe Pro Glu Pro Thr  Ala Asp Val Asn Tyr  Ile Val Met
    3065                3070                3075

Leu Thr  Cys Ala Val Cys Leu  Val Thr Tyr Met Val  Met Ala Ala
    3080                3085                3090

Ile Leu  His Lys Leu Asp Gln  Leu Asp Ala Ser Arg  Gly Arg Ala
    3095                3100                3105

Ile Pro  Phe Cys Gly Gln Arg  Gly Arg Phe Lys Tyr  Glu Ile Leu
    3110                3115                3120

Val Lys  Thr Gly Trp Gly Arg  Gly Ser Gly Thr Thr  Ala His Val
    3125                3130                3135

Gly Ile  Met Leu Tyr Gly Val  Asp Ser Arg Ser Gly  His Arg His
    3140                3145                3150
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Leu Asp  Gly Asp Arg Ala Phe  His Arg Asn Ser Leu  Asp Ile Phe
    3155                 3160                 3165

Arg Ile  Ala Thr Pro His Ser  Leu Gly Ser Val Trp  Lys Ile Arg
    3170                 3175                 3180

Val Trp  His Asp Asn Lys Gly  Leu Ser Pro Ala Trp  Phe Leu Gln
    3185                 3190                 3195

His Val  Ile Val Arg Asp Leu  Gln Thr Ala Arg Ser  Ala Phe Phe
    3200                 3205                 3210

Leu Val  Asn Asp Trp Leu Ser  Val Glu Thr Glu Ala  Asn Gly Gly
    3215                 3220                 3225

Leu Val  Glu Lys Glu Val Leu  Ala Ala Ser Asp Ala  Ala Leu Leu
    3230                 3235                 3240

Arg Phe  Arg Arg Leu Leu Val  Ala Glu Leu Gln Arg  Gly Phe Phe
    3245                 3250                 3255

Asp Lys  His Ile Trp Leu Ser  Ile Trp Asp Arg Pro  Pro Arg Ser
    3260                 3265                 3270

Arg Phe  Thr Arg Ile Gln Arg  Ala Thr Cys Cys Val  Leu Leu Ile
    3275                 3280                 3285

Cys Leu  Phe Leu Gly Ala Asn  Ala Val Trp Tyr Gly  Ala Val Gly
    3290                 3295                 3300

Asp Ser  Ala Tyr Ser Thr Gly  His Val Ser Arg Leu  Ser Pro Leu
    3305                 3310                 3315

Ser Val  Asp Thr Val Ala Val  Gly Leu Val Ser Ser  Val Val Val
    3320                 3325                 3330

Tyr Pro  Val Tyr Leu Ala Ile  Leu Phe Leu Phe Arg  Met Ser Arg
    3335                 3340                 3345

Ser Lys  Val Ala Gly Ser Pro  Ser Pro Thr Pro Ala  Gly Gln Gln
    3350                 3355                 3360

Val Leu  Asp Ile Asp Ser Cys  Leu Asp Ser Ser Val  Leu Asp Ser
    3365                 3370                 3375

Ser Phe  Leu Thr Phe Ser Gly  Leu His Ala Glu Gln  Ala Phe Val
    3380                 3385                 3390

Gly Gln  Met Lys Ser Asp Leu  Phe Leu Asp Asp Ser  Lys Ser Leu
    3395                 3400                 3405

Val Cys  Trp Pro Ser Gly Glu  Gly Thr Leu Ser Trp  Pro Asp Leu
    3410                 3415                 3420

Leu Ser  Asp Pro Ser Ile Val  Gly Ser Asn Leu Arg  Gln Leu Ala
    3425                 3430                 3435

Arg Gly  Gln Ala Gly His Gly  Leu Gly Pro Glu Glu  Asp Gly Phe
    3440                 3445                 3450
```

Ser Leu Ala Ser Pro Tyr Ser Pro Ala Lys Ser Phe Ser Ala Ser
3455 3460 3465

Asp Glu Asp Leu Ile Gln Gln Val Leu Ala Glu Gly Val Ser Ser
3470 3475 3480

Pro Ala Pro Thr Gln Asp Thr His Met Glu Thr Asp Leu Leu Ser
3485 3490 3495

Ser Leu Ser Ser Thr Pro Gly Glu Lys Thr Glu Thr Leu Ala Leu
3500 3505 3510

Gln Arg Leu Gly Glu Leu Gly Pro Pro Ser Pro Gly Leu Asn Trp
3515 3520 3525

Glu Gln Pro Gln Ala Ala Arg Leu Ser Arg Thr Gly Leu Val Glu
3530 3535 3540

Gly Leu Arg Lys Arg Leu Leu Pro Ala Trp Cys Ala Ser Leu Ala
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His Gly Leu Ser Leu Leu Leu Val Ala Val Ala Val Ala Val Ser
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Gly Trp Val Gly Ala Ser Phe Pro Pro Gly Val Ser Val Ala Trp
3575 3580 3585

Leu Leu Ser Ser Ser Ala Ser Phe Leu Ala Ser Phe Leu Gly Trp
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Glu Pro Leu Lys Val Leu Leu Glu Ala Leu Tyr Phe Ser Leu Val
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Ala Lys Arg Leu His Pro Asp Glu Asp Asp Thr Leu Val Glu Ser
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Pro Ala Val Thr Pro Val Ser Ala Arg Val Pro Arg Val Arg Pro
3635 3640 3645

Pro His Gly Phe Ala Leu Phe Leu Ala Lys Glu Glu Ala Arg Lys
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Val Lys Arg Leu His Gly Met Leu Arg Ser Leu Leu Val Tyr Met
3665 3670 3675

Leu Phe Leu Leu Val Thr Leu Leu Ala Ser Tyr Gly Asp Ala Ser
3680 3685 3690

Cys His Gly His Ala Tyr Arg Leu Gln Ser Ala Ile Lys Gln Glu
3695 3700 3705

Leu His Ser Arg Ala Phe Leu Ala Ile Thr Arg Ser Glu Glu Leu
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Trp Pro Trp Met Ala His Val Leu Leu Pro Tyr Val His Gly Asn
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Gln Ser Ser Pro Glu Leu Gly Pro Pro Arg Leu Arg Gln Val Arg
3740 3745 3750

Leu Gln Glu Ala Leu Tyr Pro Asp Pro Pro Gly Pro Arg Val His

3755 3760 3765

Thr Cys Ser Ala Ala Gly Gly Phe Ser Thr Ser Asp Tyr Asp Val
3770 3775 3780

Gly Trp Glu Ser Pro His Asn Gly Ser Gly Thr Trp Ala Tyr Ser
3785 3790 3795

Ala Pro Asp Leu Leu Gly Ala Trp Ser Trp Gly Ser Cys Ala Val
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Tyr Asp Ser Gly Gly Tyr Val Gln Glu Leu Gly Leu Ser Leu Glu
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Glu Ser Arg Asp Arg Leu Arg Phe Leu Gln Leu His Asn Trp Leu
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Asp Asn Arg Ser Arg Ala Val Phe Leu Glu Leu Thr Arg Tyr Ser
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Pro Ala Val Gly Leu His Ala Ala Val Thr Leu Arg Leu Glu Phe
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Pro Ala Ala Gly Arg Ala Leu Ala Ala Leu Ser Val Arg Pro Phe
3875 3880 3885

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Ser Val Cys Leu Leu Leu Phe Ala Val His Phe Ala Val Ala Glu
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Gly Ala Trp Ala Arg Trp Leu Leu Val Ala Leu Thr Ala Ala Thr
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Ala Leu Val Arg Leu Ala Gln Leu Gly Ala Ala Asp Arg Gln Trp
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Thr Arg Phe Val Arg Gly Arg Pro Arg Arg Phe Thr Ser Phe Asp
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Gln Val Ala His Val Ser Ser Ala Ala Arg Gly Leu Ala Ala Ser
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Leu Leu Phe Leu Leu Leu Val Lys Ala Ala Gln His Val Arg Phe
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Val Arg Gln Trp Ser Val Phe Gly Lys Thr Leu Cys Arg Ala Leu
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Pro Glu Leu Leu Gly Val Thr Leu Gly Leu Val Val Leu Gly Val
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Ala Tyr Ala Gln Leu Ala Ile Leu Leu Val Ser Ser Cys Val Asp
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Ser Leu Trp Ser Val Ala Gln Ala Leu Leu Val Leu Cys Pro Gly
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Thr Gly Leu Ser Thr Leu Cys Pro Ala Glu Ser Trp His Leu Ser
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Pro Leu Leu Cys Val Gly Leu Trp Ala Leu Arg Leu Trp Gly Ala
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Leu Arg Leu Gly Ala Val Ile Leu Arg Trp Arg Tyr His Ala Leu
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Arg Gly Glu Leu Tyr Arg Pro Ala Trp Glu Pro Gln Asp Tyr Glu
4115 4120 4125

Met Val Glu Leu Phe Leu Arg Arg Leu Arg Leu Trp Met Gly Leu
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Ser Lys Val Lys Glu Phe Arg His Lys Val Arg Phe Glu Gly Met
4145 4150 4155

Glu Pro Leu Pro Ser Arg Ser Ser Arg Gly Ser Lys Val Ser Pro
4160 4165 4170

Asp Val Pro Pro Pro Ser Ala Gly Ser Asp Ala Ser His Pro Ser
4175 4180 4185

Thr Ser Ser Ser Gln Leu Asp Gly Leu Ser Val Ser Leu Gly Arg
4190 4195 4200

Leu Gly Thr Arg Cys Glu Pro Glu Pro Ser Arg Leu Gln Ala Val
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Phe Glu Ala Leu Leu Thr Gln Phe Asp Arg Leu Asn Gln Ala Thr
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Glu Asp Val Tyr Gln Leu Glu Gln Gln Leu His Ser Leu Gln Gly
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Arg Arg Ser Ser Arg Ala Pro Ala Gly Ser Ser Arg Gly Pro Ser
4250 4255 4260

Pro Gly Leu Arg Pro Ala Leu Pro Ser Arg Leu Ala Arg Ala Ser
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Ala Lys Asn Lys Val His Pro Ser Ser Thr
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